

TWO NEW SPECIES OF THE GENUS RECURVARIA HAW.
(Lepidoptera: Gelechiidae)¹

T. N. FREEMAN²

*Insect Systematics and Biological Control Unit
Entomology Division, Ottawa, Canada*

Many species of the genus *Recurvaria* occur in North America. They may be divided into two main groups. The larvae of one group are miners in the needles of various conifers, often passing from one needle to another through a thin, silken tube along the stem. The larvae of the other group feed on deciduous plants, and usually live in a silken tube on the surface of the leaf. The genus contains many closely allied species, and the systematics of the group is not fully understood.

For several years needle miners have been pests of coniferous trees, particularly lodgepole pine, *Pinus contorta* Dougl., in the mountainous regions of Western Canada and the western United States. A recent study of these miners showed that several species are involved, most of them having been recorded as *Recurvaria milleri* Bsk., which is a pest of lodgepole pine known only from the Yosemite and Sequoia National Parks, California. A review of all the Canadian species of needle miners is in preparation, and this paper is presented to provide specific names for two new species that are currently of economic importance. For the most part, economic references are omitted because of the impossibility of making correct nomenclatorial association. The terminology used in the descriptions of the male genitalia was adopted from Heinrich (1920, Proc. U.S. Nat. Mus. 57:92, Pl. 5).

***Recurvaria starki* Freeman, new species**

Recurvaria milleri auct. (in part) nec Bsk.; Hopping, 1945, Proc. Ent. Soc. British Columbia 42:1-2; McLeod, 1951, Canadian Ent. 83:295-301.

Recurvaria sp., Stark, 1954, Canadian Ent. 86:1-12.

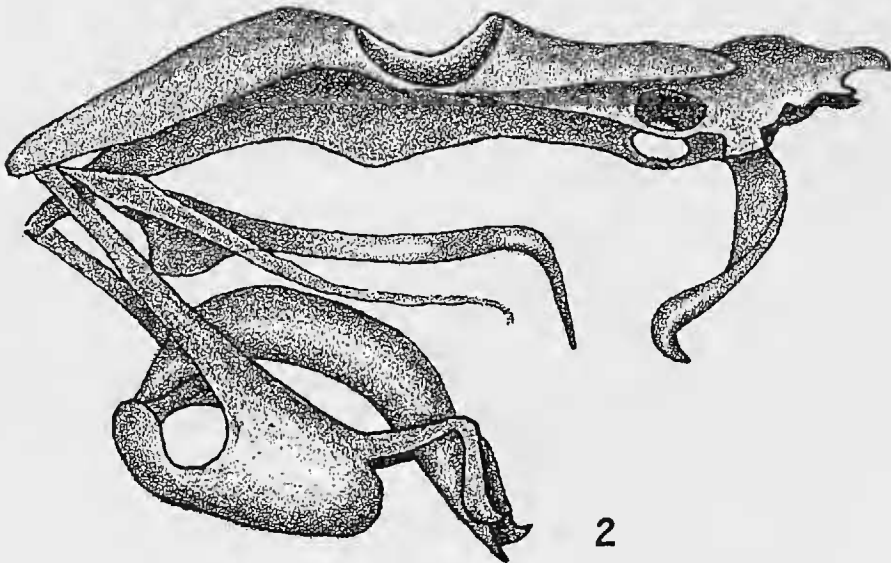
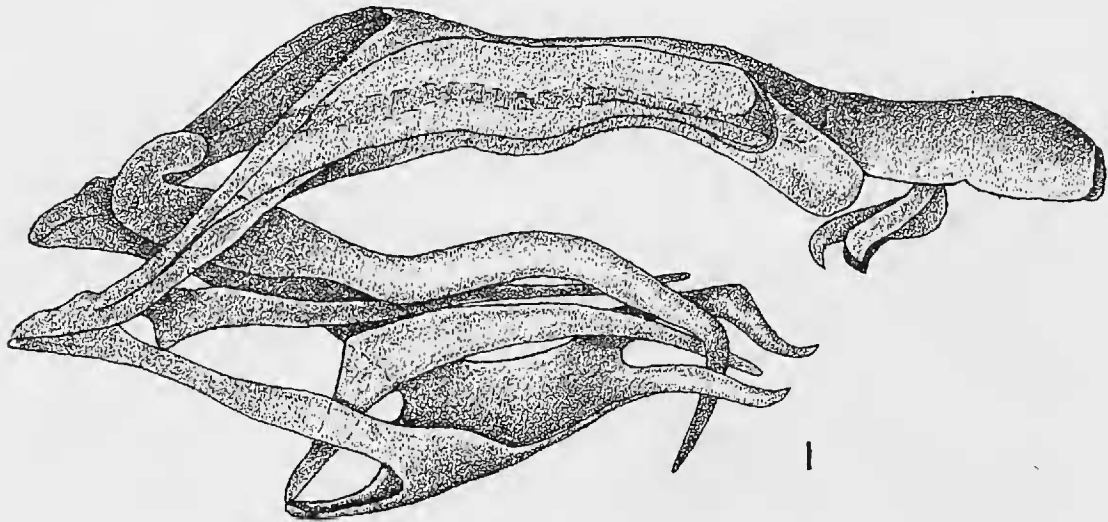
Antenna alternately marked with ochreous-white and black bands. Palpus rather short, not tufted in the male (Fig. 3). Second joint of palpus whitish inwardly, ochreous-fuscous outwardly; third joint white with ochreous-fuscous base. Face and vertex shining white. Thorax and fore wing light grey, the latter with somewhat obscure blackish patches crossing the wing at the basal third, at the outer two-thirds, and near the apex; the post-median band bordered outwardly with white and appearing to be sharply angled outwardly at its middle. The patch near the apex extending obliquely

¹ Contribution No. 3430, Entomology Division, Science Service, Department of Agriculture, Ottawa, Canada.

² Senior Entomologist.

inward almost to the posterior margin. Apex of wing mostly white, and with an obscure, blackish, central area (Fig. 6). Hind wing pale smoky. Fringes of all the wings shiny, light, ochereous-grey. Under surfaces of all the wings, dull white. Male with a long, ochereous hair-pencil arising from beneath the anal angle at the base of the hind wing. Fore and mid tibiae and tarsi alternately banded with black and white scales. Hind tibia whitish, with long hairs above. Each segment of hind tarsus grey, with a white tip. Wing expanse: 12–13 mm. Moth in the latter half of July.

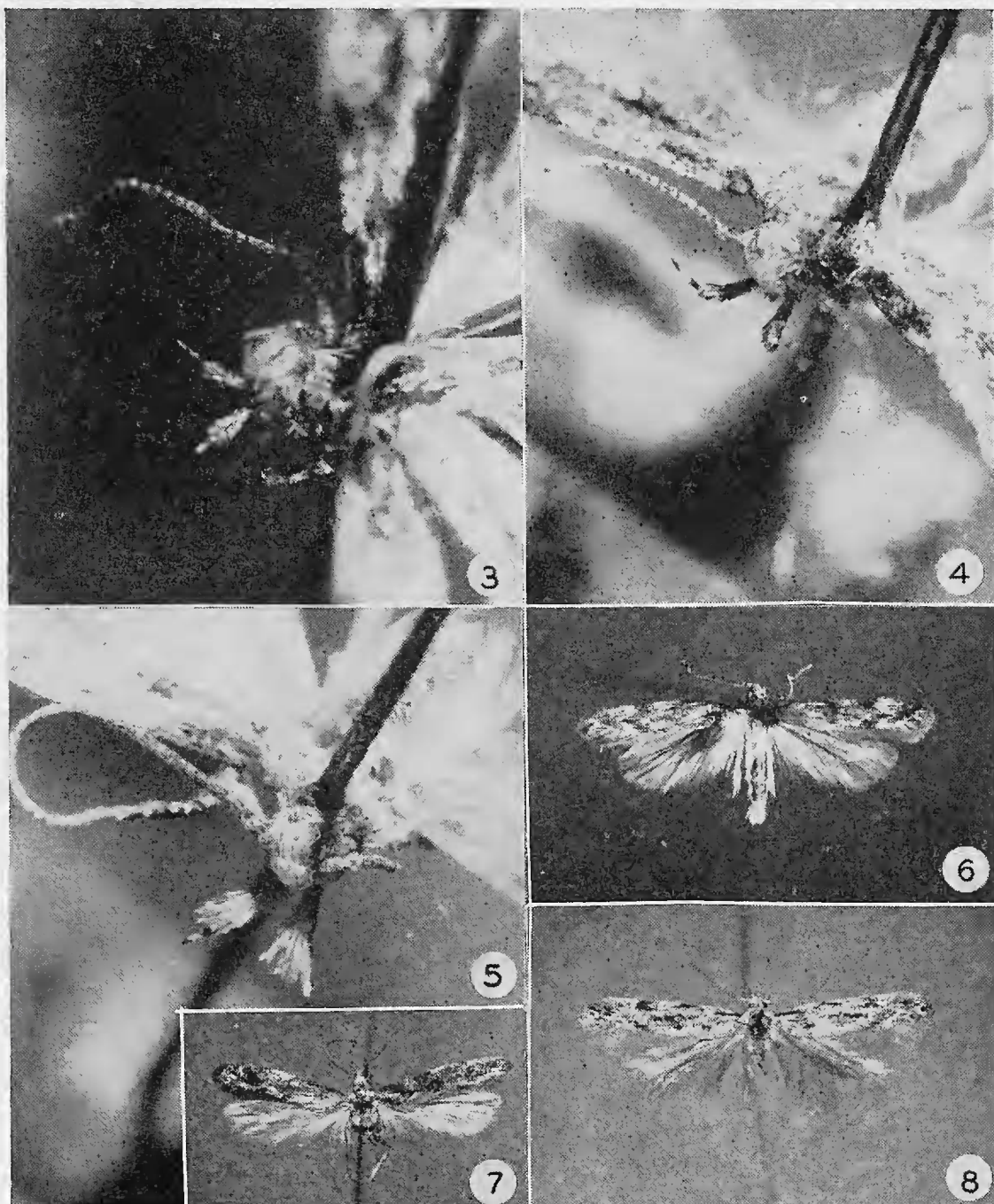
Male Genitalia (Fig. 1).—Uncus rooflike. Gnathos with three hooklike processes, the median one slightly the longest. Caudo-lateral projections of tegumen asymmetrical, flaplike. Claspers asymmetrical, tubular twisted; the right clasper much larger than the left. Aedoeagus pistol-shaped. Vinculum produced apically into two somewhat asymmetrical hooklike sicae.



EXPLANATION OF FIGURES

Figs. 1–2. Male genitalia. 1, *R. starki*; 2, *R. canusella*.

Holotype.—Male, MT. EISENHOWER (NEAR BANFF), BANFF NATIONAL PARK, ALBERTA, July 19, 1954. Reared from *Pinus contorta* Dougl. by officers of the Forest Insect Survey, Forest Biology Division. No. 6298 in the Canadian National Collection, Ottawa. *Paratypes*.—Twenty males and 16 females, Mr. Eisenhower, Banff National Park, Alberta, July 17 and 19, 1954. Eleven males and five females, Cascade Mountain (near Banff), Banff National Park, Alberta, July 18 and 19, 1954. Two males, Lake



EXPLANATION OF FIGURES

Figs. 3-5. Head and palpi. 3, *R. starki*; 4, Female of *R. canusella*; 5, Male of *R. Canusella*.

Fig. 6. Holotype, male, *R. starki*. Fig. 7. Holotype, male, *R. canusella*. Fig. 8. Paratype, female, *R. milleri*.

Louise, Banff National Park, Alberta, July 20, 1954. Two females, Mt. Edith Cavell (near Jasper), Jasper National Park, Alberta, July 15, 1954. All paratypes reared from *Pinus contorta*, and No. 6298 in the Canadian National Collection, Ottawa.

Food Plant.—*Pinus contorta* Dougl.

This species is closely allied to and has been confused with *R. milleri* Bsk. The male genitalia appear to be identical with those of that species and of *R. moreonella* Heinr., a species described from a single male reared from *Pinus scopulorum* (Engelm.) Lemmon at Cheyenne Mountain, Colorado. *R. milleri* (Fig. 8, paratype) is somewhat larger, mainly white with black longitudinal streaks or distinct irregular spots. *R. moreonella* has a narrow irregular line of white scales extending longitudinally through the middle of the wing, from the end of a sub-basal black streak to near the apex. *R. starki* and *R. milleri* are needle miners that require two years to complete their life-histories in the type localities (see Stark, 1954). This species is named in honour of Dr. R. W. Stark, who has been working on the biological and economic aspects of this species.

There is some evidence to suggest that *R. milleri*, *R. moreonella*, and *R. starki*, as well as some allied species, do not belong to the genus *Recurvaria* Haw. The male genitalia of *R. nanella* Hbn., the genotype of *Recurvaria*, are bilaterally symmetrical. The male genitalia of the group of species under consideration are asymmetrical. There is also a difference in the shape of the signum in the bursa of the female. Further studies are necessary to elucidate the generic significance of these characters.

***Recurvaria canusella* Freeman, new species**

Antenna alternately marked with ochereous-white and black bands. Palpus long and upcurved in the female (Fig. 4). Second joint of palpus whitish basally, blackish-fuscous apically; the male with a strong white triangular tuft on the inner side (Fig. 5). Face and vertex shiny white, with a few fuscous scales laterally and dorsally. Thorax and fore wing dark brown-grey, the latter with an obscure, black, raised spot below the fold at the basal one-third, the spot marked outwardly with a small white dash; a similar spot below the fold near the middle; and another above the fold at the outer two-thirds, bordered by white scales forming a small, distinct, white X; apical portion of wing speckled with white scales and small black dots or lunules; a faint white patch on the costa at the middle and one at the outer two-thirds (Fig. 7). Hind wing shiny grey. Fringes of all wings shiny light ochereous-grey. Under surface of fore wing shiny ochereous-grey, of hind wing light shiny grey. Male with a long, ochereous, hair-pencil arising

from beneath the anal angle of the hind wing. Tibiae and tarsi banded with dark-brown and white scales. Wing expanse: 10–11 mm. Moth in mid or late June.

Male Genitalia (Fig. 2)—Uncus trifid at apex. Gnathos with a single long hook. Caudo-lateral projection of tegumen strongly produced on the left side. Claspers asymmetrical, tubular, twisted; the right one considerably the larger, and expanded at the base. Aedoeagus arcuate. Vinculum produced apically into two almost symmetrical, elbowed sicae.

Holotype.—Male, SQUILAX (NEAR SALMON ARM), BRITISH COLUMBIA, June 19, 1951. Forest Insect Survey No. 50–2085. Reared from *Pinus contorta* Dougl. No. 6299 in the Canadian National Collection, Ottawa. *Paratypes*.—Three males and nine females, Squilax, British Columbia, June 19, 1951, Forest Insect Survey. Reared from *Pinus contorta*. No. 6299 in the Canadian National Collection, Ottawa.

Food Plant.—*Pinus contorta* Dougl.

This species has also been confused with *R. milleri* Bak. It is readily distinguished by the male genitalia and the suffused maculation. It is a needle miner that apparently requires only one year to complete its life-cycle.

ACKNOWLEDGMENTS

I am indebted to Dr. R. W. Stark, Forest Biology Laboratory, Calgary, Alberta, and Mr. J. H. McLeod, Entomology Laboratory, Belleville, Ontario, for their assistance in providing considerable material for study. I am also grateful to Mr. J. F. Gates Clarke, United States National Museum, Washington, D.C., for information and for the loan of many specimens.

AN IMPROVED METHOD FOR COLLECTING BRACHYCISTIDINE FEMALES

(Hymenoptera: Tiphidae)

MARIUS S. WASBAUER

University of California, Berkeley

During the summer of 1956, the author was engaged in the collection of females of the subfamily Brachycistidinae in the Coachella Valley of California. These wingless nocturnal wasps occur mainly in sandy situations and are rather difficult to collect since they are quite rare. In the past, the principal method for